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Reissue Appln. of
Patent No : 6,249,998
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For : MOVING VIRTUAL DISPLAY APPARATUS

Assistant Commissioner for Patents
Washington, D.C. 20231

VERIFICATION OF TRANSLATION

Sir:

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Signature: 

Date: June 24, 2003

[Name of Document] Specification

[Name of Invention] Moving Virtual Display Apparatus

[Claim]

[Claim1] Display apparatus wherein image is produced by moving luminous devices such as LED, luminous vacuum tube, etc. which control on/off position and timing.

[Explanation]

[0001]

[Industrial application]

This invention is relevant to display apparatus that is Smaller size and cheaper cost and moreover provides display Large in area and high in conspicuousness.

[0002]

[Conventional Technology]

Conventional display apparatus such as neon sign tower has drawbacks [1] of requiring larger area than characters and figures to be displayed, [2] of impossibility or difficulty to carry, [3] of the increasing in lighting expense such as electricity and [4] of High cost of apparatus.

Also signal bar used for construction and police has only lighting function but cannot produce characters and figures On two-dimensional space.

[0003]

[Problem to be solved by this invention]

As the size of display becomes bigger the size and weight of Signal apparatus increase, which means the increase in Manufacturing cost and maintenance expense. If it is tried to make display apparatus smaller, it results in impossibility to make displayed characters and figures large.

[0004]

[Means to dissolve the problem]

Two-dimensional expression that is virtual image of characters and figures is produced by moving body equipped with luminous devices and controlling flashing position and time of each luminous device While moving body.

[0005]

Fig. 1 is the front view of Example 1 of this invention. Plural numbers of luminous devices 2 such as LED are equipped to apparatus in shape of bar 1. In this figure, luminous devices 2 are arranged in one line but arrangement of luminous devices 2 can be done in plural numbers of line and also on both sides of bar. 3 is handle to be held by hand 4. Electric circuits 5 to control lighting of plural numbers of luminous devices 2 and battery 6 are contained in handle 3 as shown in Fig. 2.

[0006]

Electric circuits are made to wire plural luminous devices so that time T and lighting position of luminous devices 2 Switch like p1, P2 according to time t1, t2 as shown in Fig. 3. In case of swinging sideways this body using wrist 4' of hand holding handle 3 as the axis of rotation, the lapse of flashing light of LED produces the image of characters 7 expanded in size and afterimage of eye feels that the image of characters 7 seems to appear consecutively on two-dimensional space formed by the angle of swing which equals the lapse of time T. Ps is the position starting to display characters and Pe indicates the position where the display of characters ends.

[0007]

Fig. 1 shows an example of controlling the display of characters and figures by clock of circuit 5 regardless of swing speed, but it is possible to detect the angle of bar 1 to hanging weight or gyro that remain unchanged in position even if body moves as shown in fig. 1.

[0008]

Fig. 4 is the example of this invention wherein when holding handle 3 of body by hand and swinging the body 1 vertically by arm 4 or shoulder that makes the center of rotation, the weight hanging down from axis 8 and contact point

electrically touch each other at the position of Ps and clock switch turns to start the flashing of characters 7, and wherein when body comes to the position of Pe, weight 9 and contact point 10' touch electrically each other and flashing and clock switching Stop to end the flashing of characters 7 according to swing angle.

[0009]

As shown in Fig.2, plural numbers of circuit 5 and 5' are arranged and circuit 5 is to display the Character of STOP and circuit 5' is to display GO. Red LED 2 and green one 2 arranged on body to display red color for STOP and green color for GO respectively by circuits 5 and 5'.

[0010]

Fig.5 shows the example of this invention wherein body 1 with luminous devices 2 is supported by axis 12 to freely rotate, dynamic balance weight 13 is equipped on the opposite Side of body 1 and luminous device group 2 is rotated by motor M or windmill 14 to display characters 7 such as "Dr. xxxx," "Advertising Tower," etc. Surbo-motor with function of detecting angle and position, slip ring 15 and contact shoe 15' are searched for by rotating angle of body 1, and luminous device 2 equivalent to its position lights to display characters 7. It is possible to change flashing position of luminous device group by uniform rotation of body 1 that can be obtained detecting governor and also by clock instead of with rotating angle.

[0011]

The reason why windmill 14 in stead of motor is shown in Fig.5 is to make use of wind usually available in sky when this invention is used for advertising tower on roof of building and in this application if storage battery 16 is put in weight 13, storage battery 16 can be used both as power supply and as weight. Consequently the supply to electricity from outside is not required, result in need of slip-ring for supply of outside electricity from outside, which serves a double merit.

If solar battery 17 is applied on the entire surface of body 1 with luminous devices to light luminous devices 2 and also the entire surface of windmill 14 to charge electricity to storage battery 16, it provides not only the rotation of Windmill 14 but also results in no need of outside power Supply. Also, since supporter 18 is simple in construction and stand of supporter does not require to be small in area, which means very light weight body 1 can be placed on roof not withstanding heavy weight.

[0013]

Fig. 6. shows the example of this invention wherein windmill 14 shown in Fig. 5 is not required by twisting or inclining body 1 like propeller or windmill in addition to arranging 2 pieces of body 1 with luminous devices on 2 onto the surface 19 of body 1, and characters 7 and figures 20 can be produced without outside power supply. Windmill 14 and motor M also are not required by twisting or including body 1 shown in Fig. 5.

[0014]

Fig. 7 shows the example of this invention wherein this invented apparatus is applied to already built advertising tower 21 by welding pipes 22 and 22' to any position of built advertising tower 21 and putting rotating axis 12 through pipes 22 and 22' to rotate body 1 in order to obtain the display of characters 7.

[0015]

Various versions such as using other shapes than bar for horizontal Supporter of aluminous devices 2, moving luminous body in motion or in rectilinear motion or curvilinear ,etc. besides rotation are entirely involved into this invention.

[0016]

[Effect of Invention]

As this invention is an extremely small and cheap apparatus and can display images big in area and size, it is portable for such apparatus convenient use as warning light by policeman and guidance equipment Of traffic under construction and yet

it can obtain large picture. In case of applying this invention to advertising tower, because of small size, light weight and cheap cost, for instance 1/20 of conventional means, it can be built on roof of limited small area or on place or not withstanding heavy weight. This is an epoch-making invention that people standing still or walking ahead can see virtual two-dimensional image by combination of movement, time, speed, and flashing position of body.

[Description of Figures]

Fig.1 Front view of the example 1 of this invention

Fig.2 Circuit of this invention

Fig.3 Drawing of relation between flashing position and time of this invention

Fig.4 Front view of the example 2 of this invention

Fig.5 Front view of the example 3 of this invention

Fig.6 Front view of the example 4 of this invention

Fig.7 Front view of the example 5 of this invention

Explanation of Number

- 1 Body
- 2, 2' Luminous device
- 7,20 Virtual image

[Summary]

[Purpose]

This invention is to create display apparatus capable to achieve highly conspicuous display with small size and at cheap cost.

[Construction]

Moving virtual display apparatus wherein image is produced on two-dimensional space by moving body with luminous devices such as LED, luminous vacuum tube, etc. and at the same time by controlling the flashing position and time of said body.

[Drawing]

Fig. 1